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December 19, 2013

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Washington State Department of Ecology
3100 Port of Benton Blvd.
Richland, WA 99354

Re: Comments of Hanford Challenge on the Proposed Permit Modification of the Hanford Facility RCRA Permit, Dangerous Waste Portion, Revision 8C, for the Treatment, Storage, and Disposal of Dangerous Waste, Part III, Operating Unit 10, Waste Treatment and Immobilization Plant, WA 7890008967

Hanford Challenge is an independent 501(c)(3) organization based in Seattle, WA whose purpose is to help create a future for Hanford that secures human health and safety, advances transparency and accountability, and promotes a sustainable environmental legacy. Hanford Challenge supports and empowers whistleblowers, collaborates with NW stakeholders, including the Hanford workforce, Tribes, Hanford Advisory Board members, community organizations and concerned citizens to advocate for safe and protective cleanup remedies.

Hanford Challenge joins the Yakama Nation ERWM program request that Washington State Department of Ecology "deny incorporation of the Permit modification package #BOF-001 , Rev 0, Container Storage Area for the Balance of Facilities (Failed Melter Storage Facility), and edit the new Compliance Schedule to read as follows: Submit BOF-001 permit package final design for the Failed Melter Storage Building (Building 32)." Our comments go beyond this request, however.

Hanford Challenge advocates that the Department of Ecology order a stop to all ongoing work at the Waste Treatment Plant unless and until the Department of Energy is able to demonstrate that safety and quality assurance legal requirements *can be met* in order for the facility to operate.

Our reasons for this request are documented below.

The Hanford Waste Treatment Plant was originally scheduled to open in 2011, at a cost of $4.6 billion. Mismanagement and technical failures have contributed to project delays and the cost of the facility has ballooned to over $13 billion. The current opening date of 2019 is in serious doubt. The DOE is admitting that elements of the design are unsafe and that redesign is likely, especially in the Pre-Treatment Plant and the High-Level Waste Melter. New facilities and processes are being proposed that have not been designed, budgeted, or even thought through. It is clear to many of us that DOE is desperately throwing ideas against the wall to see what might stick. Instead of preparing to commission and test the facility, and with 13 years and billions of dollars spent, DOE is back to Conceptual Design Phase 1….the drawing board.

There are numerous technical questions and issues, listed below, that have been brought to light by various organizations including the U.S. Department of Energy—Office of River Protection (ORP), Department of Energy Office of Inspector General, and the Defense Nuclear Facilities Safety Board as well as internal technical experts such as the Manager for Nuclear Safety, the former Chief Engineer for WTP, a Senior ORP Scientist assigned to WTP, and the former Manager for Research and Technology.

The Office of River Protection has recently issued a completed Quality Assurance audit of BNI and cited two level one findings; one that states NQA-1 (nuclear quality) has not been properly implemented (not fully effective) by Bechtel on the WTP project and the other is related to an ineffective corrective action process. These findings substantiate **stopping all work** until a fully effective nuclear safety design and corrective action process is established to prevent further departures from the realization of a safely designed and operating facility. It should be noted that DOE in the very same audit stated that the BNI implementation of quality assurance was "adequate," which casts further doubt on the Department's ability to properly exercise the role of design and safety oversight for the WTP project.

The DOE Inspector General (IG) issued a report in September 2013 stating that Bechtel repeatedly made design changes to plant equipment without a proper safety review, a problem the IG called "systemic." The fact that the IG used the term "systemic" to describe the failure to implement safety into the design can be viewed to mean that the plant and facility design was not done to nuclear standards which therefore compromises the very systems, structures and components that should protect the collocated worker, public and environment. This information directly substantiates the December 19, 2012 stop work letter issued by DOE's Chief Engineer specifically related to indeterminate quality and an ineffective corrective action process.

Why would anyone continue with the design when their very process lacks fidelity and produces an indeterminate design with resultant indeterminate procurements?

Listed below are a number of technical issues that are currently under scrutiny. Because these issues concern systems regulated under the WTP Permit, they raise questions about the validity of the system documentation contained in the permit.

- Breakdown in the quality assurance/quality control function at the WTP, including design deficiencies, failure of the corrective action program, failure of Bechtel to submit nuclear safety-related design documents for nuclear safety review, and much more.
- Vessel corrosion and erosion on vessels and associated equipment.
- Vessel margin calculations.
- Metallurgy of vessels and associated ancillary equipment and miscellaneous units.
- Vessel mixing issues and subsequent changes in design.
- Removal or redesign of vessels and ancillary equipment from the facility due to change in the system design.

- Structural issues and subsequent changes in design of vessels and their internal components.

A review of the Administrative Record reveals an August 30, 2013 letter from Ecology's Nuclear Waste Program to the Manager of the DOE's Office of River Protection and to Bechtel, regarding concerns about the accuracy of the current version of the WTP Permit. Ecology listed most of the concerns listed above, and stated that "we question the validity of the system documentation in the WTP Permit." Ecology requested that DOE and Bechtel determine which documents "may be in question and which remain valid. The intent of this review is to assure that the WTP Permit is accurate and represents the actual status of the WTP Project."

DOE's response, contained in the letter, was that DOE was not going to conduct the review requested by Ecology "because it is not practical or resource effective."

This stark refusal by DOE to take the time to validate and update its own records in response to the regulator's request about the validated technical issues related to the WTP speaks volumes about the trouble we are facing. DOE's unwillingness to face reality or conduct a safe and effective response to the safety and quality concerns raised by numerous entities about the WTP is the same attitude that led to the development of the safety and technical issues in the first place.

It was gratifying to see Ecology's response to the DOE snub, which was that Ecology would conduct its own review and "place administrative holds on portions of the WTP Permit that may be in question." The result of placing that hold means that Bechtel "may not proceed with construction of that portion of the WTP facility."

Hanford Challenge supports this approach, and urges Ecology to *not* proceed with the Permit Modifications and instead place the Administrative Holds and effectively stop work until the documentation is validated, and the technical issues resolved.

DOE Chief Engineer Raises Safety and Quality Concerns, Calls for Stop Work

An August 23, 2012 memorandum from the DOE's Chief Engineer for the Waste Treatment Plant, Mr. Gary Brunson, documented "34 instances and technical issues in which Bechtel National Inc. acting as Design Authority for the Waste Treatment and Immobilization Plan (WTP) has provided design solutions and technical advice to the Department of Energy which either was determined to be factually incorrect, provided a design solution that was not technically defensible, technically viable, or was technically flawed considering identified requirements." Memorandum, G. Brunson, WTP Engineering Director, to S. Samuelson, Manager, Office of River Protection, DOE, GEB 12-WTP-0274, August 23, 2012. (Brunson Memo).

The memo stated that Bechtel had provided a design solution that was not safe for the WTP operators, or designs that did not comply with the safety basis. The Chief Engineer stated that

Bechtel had provided an installed equipment system that did not meet safety requirements or was not adequately inspected following installation even when defects became known. Brunson Memo.

The technical issues documented by Brunson demonstrate consistent non-compliance between requirements and selected designs implemented in the field, and between design of and realization of a safe operating facility. Repair and rework of these non-compliant designs are leading to significant project cost and schedule impacts. It has been separately disclosed that the Pretreatment and HLW Vitrification facility designs are not in compliance with the Authorization Basis. Brunson wrote in his memorandum,

> "The number and significance of these issues indicate that Bechtel National Inc. is not competent to complete their role as the Design Authority for the WTP, and it is questionable that BNI can provide a contract-compliant design as Design Agent." Brunson Memo at p. 3.

Brunson went further with his concerns in December 2012 when he wrote to the Secretary of Energy advocating that the DOE stop all work at the facility. Stop Work Memorandum, G. Brunson, WTP Chief Engineer, DOE ORP, to S. Chu, Secretary of Energy, GEB 12-WTP-0399, December 19, 2012. (Brunson Stop Work Memo).

The Stop Work memorandum cited a list of seven "Priority Level 1 Findings" which remain unresolved with an undetermined path forward. The memo stated:

> The Level 1 Findings are objective evidence of a condition of Indeterminate Quality. The Office of River Protection Quality Assurance Program Description includes among our basic beliefs: "Work suspension is appropriate when continued work would be unsafe, would be likely to be creating rework, and when safety or quality is indeterminate." (MGT-PM-PL-04, Rev 2).
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> This memorandum recommends, based upon a compelling body of objective evidence demonstrating Indeterminate Quality throughout the WTP facilities, that all activities affecting engineering design, nuclear safety, and construction and installation of all Structures, Systems and Components be stopped to avoid further nuclear safety compromises and substantial rework within WTP. In addition, a full 100% systematic extent of condition is warranted related to all the findings which should also be reviewed for fidelity by an independent agency. Brunson Stop Work Memo at p. 1.

In an attachment to the memo, Brunson outlined some of the deficiencies cited in the Priority 1 findings:

1. A total of ten (10) WTP process vessels were found to have anticipated, maximum operating temperatures in excess of the corrosion related limiting temperature identified in corrosion literature for the selected materials of construction.

2. Overarching programmatic noncompliance finding based on major Quality Assurance Manual (QAM) non-compliances with respect to BNI QAM, Design Control, and Test Controls requirements.
3. BNI presumed the materials selection process utilized design inputs were conservative; however, during material confirmation, it was determined not conservative because it did not account for major changes in PreTreatment Facilty processing raised by DOE's Review of Design Oversight of Black Cell Adequacy,' a Blue Ribbon Panel Review, and a recent DOE surveillance.
4. Contrary to the requirements of DOE Order 413.3A. BNI did not establish a margin management strategy/program that establishes and maintains design margins, implemented through the Project Execution and Risk Management Plans. Contrary to the commitment made in the Declaration of Readiness, BNI did not manage design margin with a level of' importance commensurate with a design-build project and with required documentation in calculations.
5. Contrary to DOE Order 420.1B Chapter V. BNI did not include design and safety margin management in the WTP Configuration Management Plan, as integral to the System Engineer Program.
6. Contrary to the BNI Safety Requirements Document, BNI did not implement the required use of conservative design margins and for establishing and verifying adequate safety margin through the operating life. This adverse condition is a Priority Level 1 finding because it is a systemic breakdown that has impact on quality, worker health or safety, the public, the environment, facility operations, and regulatory compliance.
7. Several recent DOE oversight activities have resulted in the identification of significant performance issues. These issues, combined with a number of less important, but still representative, examples of less than adequate performance, indicates a systemic integrated management performance concern.
8. Twenty vendor related procurement oversight findings, described in assessment report S-12-RPPWTP-004, demonstrate a lack of compliance with contract requirements and collectively are considered a Procurement Related Management Concern.
9. Thirty six examples from twenty seven calculations did not comply with quality assurance requirements for correct selection of design inputs, or for providing appropriate technical justification within the calculation. The set of six findings above from a small sampling of calculation content is a cumulative indication of a systemic breakdown in quality.

   Brunson Stop Work Memo Attachment.

Other prominent officials who have gone on record with serious concerns about the safety and effectiveness of the facility include Dr. Walter Tamosaitis, who was removed from his position working on the WTP after he raised numerous safety and technical concerns in 2010 and terminated by URS in October 2013; Donna Busche, the Manager for Environmental and Nuclear Safety for the WTP; and Dr. Donald Alexander, the DOE’s chief Scientist who was responsible for reviewing the design of the WTP. The Defense Nuclear Facilities Safety Board (DNFSB), an agency charged by Congress to oversee DOE nuclear safety, has also issued many critical reports and findings against the DOE over WTP activities.

DOE Inspector General

In September 2013, the DOE's Office of Inspector General released an audit report of the Waste Treatment Plant which validated that Quality Assurance problems remain problematic. (*See*, DOE OIG Audit Report, "Department of Energy Quality Assurance: Design Control for the Waste Treatment and Immobilization Plant at the Hanford Site," DOE/IG-0894 September 2013)(Attachment 3). (DOE/IG-0894 Audit Report).

The Inspector General report found:

> Our review revealed significant shortcomings in the Department's process for managing the design and fabrication changes of waste processing equipment procured for the WTP. Specifically, the Department had not ensured that Bechtel:
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> - Subjected design changes requested by suppliers to the required review and approval by Bechtel's Environmental & Nuclear Safety Group (Nuclear Safety), the organization responsible for ensuring that design changes do not impact facility safety.
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> - Early in our review, in September 2012, we brought several instances in which design changes requested by suppliers had not received required safety reviews to the attention of the Department and Bechtel. Bechtel confirmed the issue and performed an "extent of condition" review of certain design changes to determine the scope of the problem. In its review of a sample of 235 of 4,028 supplier design documents spanning a 3-year period, Bechtel discovered that more than a third of the changes made to supplier design documents had not received the required Nuclear Safety review and approval, and, that the problems were systemic.
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> - Properly verified that deviations from design requirements that could affect nuclear safety were implemented. Bechtel could not demonstrate that it had verified suppliers' actions to address deviations from design. For example, we identified that Bechtel approved action to repair a Low-Activity Waste melter lid that did not meet design specifications. Bechtel was unable to provide evidence that: (1) the supplier had made the necessary repairs to the lid; and (2) it had reexamined the repair to ensure that it met requirements. Neither Bechtel nor the Department could confirm that the design changes were actually completed and met safety related design requirements. In this regard, the absence of affirmation that the changes were completed as required carried with it potentially serious implications. In short, quality reviewers were unable to determine, with certainty, whether the Low-Activity Waste melter lid would successfully perform its safety function to confine harmful byproducts (nitrogen oxide gases) produced during the waste vitrification process.
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> DOE/IG-0894 Audit Report at Pp. 1-2.

The Inspector General criticized Bechtel over "not effectively implemented its own quality assurance procedures. The exclusion of Nuclear Safety from the design change process can be traced to poor implementation of existing procedures. According to Bechtel officials, procedures governing Nuclear Safety review provided 'opportunities for interpretation' that led to 'incorrect assumptions' by its engineers. These assumptions led Bechtel's engineering group to incorrectly conclude that design changes would not affect the Authorization Basis and, as such, that it was appropriate to bypass Nuclear Safety." DOE/IG-0894 Audit Report at p.2.

The Inspector General also documented that Bechtel did not have quality control procedures or processes "to ensure that deviations from design or specifications were documented to support product fabrication and delivery. Furthermore, Bechtel did not require suppliers to submit reports detailing actions taken to address needed deviations, documents that would have provided additional confidence that needed design changes and/or repairs were properly completed." DOE/IG-0894 Audit Report at p.2.

> Collectively, these problems led to the creation of major design vulnerabilities. We found that Bechtel did not always comply with internal Bechtel procedures and failed to adequately and consistently document supplier initiated design changes. Proper design control is essential to ensure that critical equipment is properly fabricated to specifications and will perform its safety function. *The lack of a robust design control process makes it difficult to ascertain whether all necessary safety-related design activities are adequate and that workers, members of the public, and the environment are adequately protected.* Without improvements to design control, confidence that procured equipment meets requirements for the safe operation of the WTP will erode. DOE/IG-0894 Audit Report at p.3 (emphasis added).

The Inspector General's September 2013 report was not the first time the OIG found problems with the WTP's Quality Assurance program. An April 12, 2012 DOE Inspector General report, DOE/IG-0863, entitled, "Audit Report on "The Department of Energy's $12.2 Billion Waste Treatment and Immobilization Plant – Quality Assurance Issues – Black Cell Vessels," found:

- "[T]he Department had procured and installed vessels in WTP that did not always meet quality assurance and/or contract requirements . . .we identified multiple instances where quality assurance records were either missing or were not traceable to the specific area or part of the vessel."

- "We also found that the Department paid the WTP contractor a $15 million incentive fee for production of a vessel that was later determined to be defective. Although the Department demanded return of the fee, it did not follow up on the matter and the fee was never reimbursed. Weaknesses in quality assurance records associated with black cell and hard-to-reach processing vessels occurred because of deficiencies in Bechtel's implementation of its quality assurance program and a lack of Department oversight."

- "The importance of black cells and hard-to-reach components cannot be over stated. Premature failure of these components could potentially impact safety, contaminate large

> portions of a multi-billion dollar facility and interrupt waste processing for an unknown period of time. For these reasons, we have made several recommendations designed to strengthen quality assurance controls at WTP. We have also recommended a more intense effort to recover contractor fee for the nonconforming vessel."
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> DOE/IG-0863 Audit Report Memorandum to the Secretary at Pp. 1-2.

Conclusion

Rather than issue a Permit Modification for continuing work on the Waste Treatment Plant, the State of Washington's Department of Ecology should focus instead on determining whether the WTP, at this stage, can possibly meet safety and quality requirements given that the WTP physical infrastructure is over 65% complete and design 90% complete. DOE cannot recover from a "quality indeterminate" facility – it cannot hope to "inspect in" quality and safety at this late date. Either the components, equipment and materials are quality-verified and validated, complete with required documentation, or not. If the answer is that they are not, which seems to be the clear consensus from the various official findings above, then an emergency Plan B will be necessary in order to complete a viable, safe and effective treatment system for Hanford's high-level waste.

Respectfully submitted,

Tom Carpenter, Executive Director
Hanford Challenge

cc: Dr. Ernest Moniz, Secretary, Department of Energy, Washington, DC
Senator Patty Murray, U.S. Senate
Senator Maria Cantwell, U.S. Senate
Senator Ron Wyden, U.S. Senate
Senator Jeff Merkley, U.S. Senate
Governor Jay Inslee, State of Washington
Matt McCormick, U.S. Department of Energy, Richland Office
Kevin Smith, U.S. Department of Energy, Office of River Protection
Stuart Harris, Confederated Tribes of the Umatilla Indian Reservation
Russell Jim, Yakama Indian Nation
Gabriel Bohnee, Nez Perce Tribe
Ken Niles, Oregon Department of Energy
Steve Hudson, Hanford Advisory Board